

REMARKS

Applicants acknowledge with appreciation the withdrawal of the previously stated bases for rejection.

Reconsideration of presently solicited method Claims 16 to 21 and 23 respectfully is requested. For the reasons indicated in detail hereafter, these claims are urged to be in condition for allowance.

Applicants have provided a series of process steps while using specific starting materials to form a quality semiconductor nanocrystal pattern on a substrate. This contribution of Applicants as defined in the presently solicited claims deserves recognition. The specified process steps while using the specified starting materials make possible the creation of a precise predetermined pattern in the form of a dense semiconductor nanocrystal thin film while advantageously retaining the nanocrystalline properties of the specified starting material. The resulting pattern inherently displays the luminescence characteristics of the semiconductor nanocrystals prior to the formation of the pattern and an enhanced light emitting efficiency. The excellent luminescence characteristics of the resulting product enable its utilization in solid state devices, such as organic light emitting diodes and photovoltaic devices.

The continued rejection of presently solicited Claim 16 as being anticipated under 35 U.S.C. §102(b) in view of the different teachings of U.S. Patent No. 6,258,506 to Lawandy would be inappropriate. Lawandy concerns in all instances a security article utilizing a polymer dispersed liquid crystal. It must be recognized that Lawandy does not disclose a method for forming a semiconductor nanocrystal pattern on a substrate comprising the step of coating a substrate with a dispersion in

an organic solvent of semiconductor nanocrystals which are surface-coordinated with a compound containing a photosensitive functional group. The liquid crystal is responsive to an applied electrical field for varying the visual characteristics of the security article. In Lawandy liquid crystal domains are microencapsulated with an orientable absorber dye (or alternatively semiconductor nanocrystals) and are formed only in irradiated regions. The properties of the aligned and non-aligned liquid crystal molecules are employed to provide a security article capable of assuming different visual characteristics (See Col. 7, lines 27 to 31 and Col. 11, lines 1 to 12). In contrast the semiconductor nanocrystals of Applicants are not treated in this manner, and thus the semiconductor nanocrystals of Lawandy should not be considered to contain a surface-coordinated photosensitive functional group. In Lawandy, the liquid crystal domains are micro-encapsulated with a semiconductor material and Lawandy does not disclose the formation of a pattern by using surface-coordinated semiconductor nanocrystals as specifically claimed by Applicants. As indicated, an orientable absorber dye may be included or semiconductor nanocrystals in the different technology of Lawandy. The visual characteristics of the liquid crystal are switched between two states as a function of the presence or absence of an electrical field. Applicants' specifically claimed contribution does not rely upon a domain change of a liquid crystal. There is nothing comparable to Applicants' combination of process steps in the different technology of Lawandy. Lawandy is silent concerning the coating of a substrate with a dispersion comprising semiconductor nanoparticles surface-coordinated with a compound containing a photosensitive functional group. This is not even remotely suggested by Lawandy. Lawandy merely discloses forming a striped pattern by applying UV light through a

mask to form liquid crystal domains having a visually distinctive appearance. Additionally, in Applicants' step (c), selective exposure takes place wherein a crosslinking reaction takes place resulting in a solubility difference between exposed and unexposed areas. Support for this claim language is found in Applicants' Specification at Page 17, lines 13 to 23. Also, there is nothing comparable to Applicants' step (d) in the different technology of Lawandy. The subject matter of dependent Claim 22 has been incorporated into independent Claim 16. The developing of the exposed film is carried out with the use of an organic solvent, a weakly acid or basic solution, or water. No anticipation is presented by the different teachings of Lawandy for a number of reasons.

It is well established law that patentability is negated under 35 U.S.C. §102 only when the prior disclosure is identical to the invention sought to be patented. Each and every element of the claimed invention must be disclosed in a single reference in complete detail. See Akzo N.V. v. United States ITC, 808 F.2d 1471, 1 U.S.P.Q.2d 1241 (Fed. Cir. 1986); Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1 U.S.P.Q.2d 1081 (Fed. Cir. 1986); Rolls-Royce Ltd. v. GTE Valeron Corp., 800 F.2d 1101, 231 U.S.P.Q. 185 (Fed. Cir. 1986); Kloster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 U.S.P.Q. 81 (Fed. Cir. 1986); Great Northern Corp. v. Davir Core & Pad Co., 782 F.2d 159, 228 U.S.P.Q. 356 (Fed. Cir. 1986); In re Donohue, 766 F.2d 531, 226 U.S.P.Q. 619 (Fed. Cir. 1985); W.L. Gore & Assoc. v. Garlock, Inc., 721 F.2d 1540, 220 U.S.P.Q. 303 (Fed. Cir. 1983); SSIH Equip. S.A. v. United States ITC, 713 F.2d 746, 218 U.S.P.Q. 678 (Fed. Cir. 1983); and Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 U.S.P.Q.2d 1913

(Fed. Cir. 1989). The withdrawal of the rejection respectfully is urged to be in order and is respectfully requested.

Likewise the continued rejection of presently solicited Claims 17 to 19 as being rendered obviously apparent under 35 U.S.C. 103(a) over the different teachings of newly cited U.S. Patent No. 6,259,506 to Lawandy combined with the different teachings of previously cited U.S. Patent Publication No. 2005/0008880 to Kunze et al. would be without sound technical and legal bases. No *prima facie* showing of obviousness exists with respect to the presently solicited claims. The diverse teachings of the primary and secondary reference are not reasonably combinable and even if the teachings of the references were somehow combined, Applicants' specifically claimed contribution would not result. The very basic deficiencies of Lawandy are previously discussed. Kunze et al. in all instances utilizes different starting materials, different process steps, and forms a different product.

The different teachings of Kunze et al. are apparent from a detailed reading of this publication. The starting material requires the initial use of Si and/or Ge semiconductor nanoparticles. A cyclic Group IVA compound of the formula $(AH_x)_n$ or $(AH_x)_m (AH_yR_{z-y})_p (ZR^1_w)_q$ is employed where A is Si or Ge with organic portions such as alkyl, aryl, or halogen. The different film of Kunze et al. is subjected in all instances to an annealing/curing/sintering step at a temperature above 200°C in an inert or reducing atmosphere. Applicants' claimed process includes nothing comparable to this annealing/curing/sintering step. When practicing the Kunze et al. annealing/curing/sintering process step the organic portions of the cyclic compound are decomposed and a sintered amorphous structure is formed wherein the

components are bound together to form a linked mixed structure with loss of crystallinity. Such structure would possess dissimilar bulk properties.

In contrast, the presently claimed process reliably forms a film in a predetermined pattern wherein nanoparticle properties of CdTe, ZnS, ZnSe, ZnTe, HgS, HgSe, HgTe, GaN, GaP, GaAs, InP, InAs, and mixtures of these are retained. The final pattern continues to display the advantageous luminescence characteristics of the specified nanoparticles starting material. Applicants' nanoparticles are not sintered with each other. Since the present process creates a nanocrystal film pattern that exhibits nano properties with excellent luminescence with enhanced light emitting efficiency, it can be utilized in organic light emitting diodes and photovoltaic devices where reduced tolerances are necessary. In contrast, the different bulk film produced by Kunze et al. using different starting materials can be utilized in thin film transistor or radio frequency identification tags where end use tolerances are greater.

Finally, the continued rejection of presently solicited Claims 20 and 21 under 35 U.S.C. § 103(a) over the different teachings of Lawandy in view of the different teachings of Kunze et al. combined with the deficient teachings of U.S. Patent 5,178,959 to Eckberg et al. would be similarly inappropriate. Basic deficiencies of the Lawandy and Kunze et al. teachings with respect to the presently solicited claims previously are identified. Reference to an exposure dose in the context of Eckberg et al. which pertains to UV-curable compositions containing epoxy-functional fluorosilicones falls far short of remedying basic deficiencies in the teachings of Lawandy and Kunze et al. Even if the teachings of the references were somehow combined, the contribution of Applicants' presently solicited claims still would not

result or otherwise be rendered obviously apparent. The overall teachings of the references relate to different technology.

It is basic to the examination process that in order to establish *prima facie* obviousness of a claimed invention, all of the claim limitations must be taught or suggested by the prior art. See M.P.E.P. §2143.03 in this regard. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (CCPA 1974). "All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 U.S.P.Q. 494, 496 (CCPA 1970).

The present solicited claims are urged to well distinguish over the different teachings of the references alone or in combination.

In the event there is any remaining point that requires clarification prior to the allowance of the Application, the Examiner is respectfully urged to telephone the undersigned attorney so that the matter can be discussed and resolved.

Respectfully submitted,

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Date: August 1, 2006

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